

Teaser Memorandum

Biosolomon Inc.

Title(Name of Technology) :

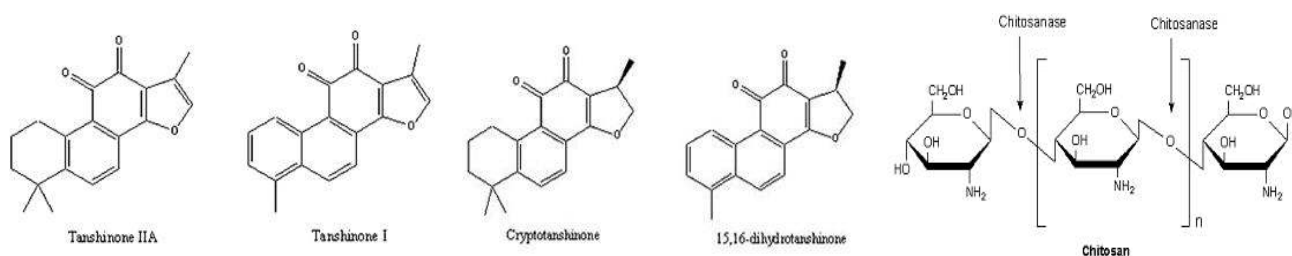
Anti-osteoporotic and anti-menopausal disorder agent

<p>Executive Summary</p> <p>Dr. Han Jung, Chae, a professor of Chonbuk National University, and Dr Hyung Ryong, Kim, a professor of Wonkwang University have developed novel Anti-osteoporosis agents that are very interesting in terms of efficacy, safety and commercializing potential.</p> <p>Osteoporosis is a systemic disorder characterized by decreased bone mass and microarchitectural deterioration of bone tissue leading to bone fragility and increased susceptibility to fractures of hip, spine, and wrist. The most common cause of osteopenia is osteoporosis; other causes include osteomalacia and the bone disease of hyperparathyroidism.</p> <p>Biosolomon Inc. intends to enter into a technology transfer or licensing transaction with regard to anti-osteoporosis agents. Terms of the transaction are not set, and interested parties may further discuss the details if they wish to enter into an agreement.</p>	<p>■ Company Description</p> <ul style="list-style-type: none"> □ CEO : Chae Han Jung □ Established: January, 2006 □ No. of Employees: 3 □ Address: 949-10 Seosin-dong, Wansna-Gu, Jeonju-city, Jeollabuk-do 156-640
<p>Industry Sector: 1. Academic/Research: Biotech, Pharmaceutical 2. Animal health: Pharmaceutical 3. Biotech: Human therapeutics, 9. Pharmaceutical: Personal Care</p> <p>Therapeutic Target: 10. Genito-urinary (Menopause)</p> <p>Development phase: early stage</p> <p>Type of business relationship sought (including licensing availability): development collaboration, or non-exclusive or exclusive licensing agreement</p>	<p>■ Business Fields</p> <ul style="list-style-type: none"> □ Research and Development □ Funded research service
<p>Key Technology Highlights</p> <ul style="list-style-type: none"> □ Significant Efficacies in Anti-osteoporosis A series of compositions from Salvia miltiorrhiza extracts and chitosan shows remarkable anti-osteoporosis activities which were verified in animal experiments using rats. In addition, compositions are expected to have activities on anti-myocardial Ischemia and memory consolidation according to previously reported studies. □ Little or No Side Effects In animal tests, no side effects were observed for animals administered with Salvia miltiorrhiza extracts and chitosan. □ Positive Product Image As many anti-osteoporosis chemical synthetic drugs have serious side effects, natural substance extracts of present technology will gain positive impression in market. □ IP Position The present technology had been filed for a patent application and patented in Korea. 	<p>■ Company History</p> <ul style="list-style-type: none"> □ Founded in 2006 □ Focusing on discovery of novel drugs and developing foods for specified health use □ First patent application granted in 2007

Technology Overview

Technology Platform

The core technology of Biosolomon Inc. is to provide promising anti-osteoporosis agents, *Salvia miltiorrhiza* extracts and chitosan. The compositions comprising *Salvia miltiorrhiza* extracts and chitosan exhibit anti-osteoporosis activities which confirmed by tests with rat ovariectomy model(OVX). *Salvia miltiorrhiza* extracts comprise Tanshinone I, tanshinone IIA, cryptotanshinone and dihydrotanshinone as effective compound.



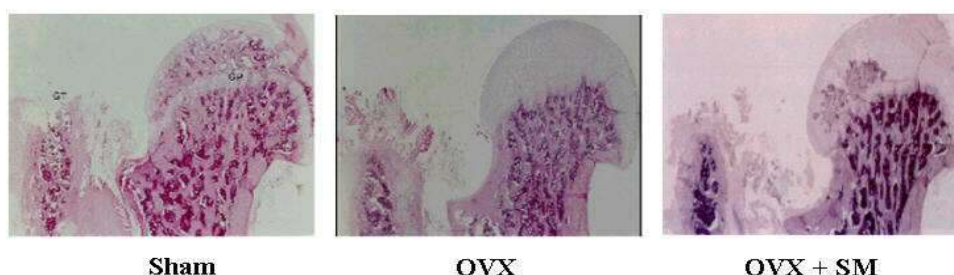
Background and unmet needs

Osteoporosis is one of the menopausal disorder caused by decrease in estrogen level. Aging, unbalanced dietary habits, liver diseases, thyroid diseases are also known as direct or indirect cause of osteoporosis. ERT(estrogen replacement therapy), Bisphosphonate and PTH(parathyroid hormone) had been used to treat osteoporosis but have finally failed to effectively treat osteoporosis without side effect such as headache, edema, endometrial cancer, breast cancer. Safe anti-osteoarthritis agents or materials would occupy huge market because of innumerable world wide patients

Discovery and Achievements

Compositions of Biosolomon Inc. has been developed on the basis of findings that the *Salvia miltiorrhiza* and chitosan have excellent anti-osteoporosis activity. When administered with compositions of present technology, the area of trabecular bone in OVX rat is maintained as the level of that of control rats, during other OVX decrease. in addition, the thickness of trabecular bone in OVX Is also maintained and seperations of trabecular bone are decreased.

Fig. 1. Cross sections of bone in control (Sham), OVX and OVX + SM(*Salvia miltiorrhiza* extracts and chitosan)



Trabecular bone was shown to be filled between growing junction and thick area in OVX+SM rat
Present inventors identified 4 effective compounds of tanshinone I, tanshinone IIA, cryptotanshinone and

dihydrotanshinone in *Salvia miltiorrhiza* extracts using spectroscopic technics, and selected tanshinone IIA as a marker compound.

Table 1. Comparisons of trabecular bone area(%), thickness(μm) and separation(μm) of control (Sham), OVX and OVX + SM mice

Groups	No. of Animals	Trabecular bone area (%)	Groups	No. of Animals	Trabecular thickness (μm)	Groups	No. of Animals	Trabecular separation (μm)
Sham	10	56.95 ± 8.2	Sham	10	95.24 ± 7.8	Sham	10	109.08 ± 23.40
OVX	10	$33.43 \pm 5.1^{***}$	OVX	10	$46.92 \pm 5.1^{***}$	OVX	10	147.98 ± 50.2
OVX+SM	10	$47.16 \pm 6.9^{\#}$	OVX+SM	10	$74.34 \pm 10.0^{###}$	OVX+SM	10	$97.85 \pm 6.1^{***}$
OVX+K	10	$43.34 \pm 5.7^{\#}$	OVX+K	10	$66.49 \pm 9.3^{###}$	OVX+K	10	$85.43 \pm 15.4^{***}$
OVX+SM+K	10	$48.75 \pm 5.4^{\#}$	OVX+SM+K	10	$77.72 \pm 8.4^{###}$	OVX+SM+K	10	$99.72 \pm 11.9^{***}$

Application

Based on strong anti-osteoporosis activity and natural origin of compositions, it is possible to develop as functional food for specified health use as well as conventional drug. In case of drug application, mass production using organic chemistry process is available owing to identification of pharmaceutically effective compound

Patents and Publications

Biosolomon Inc. has patents granted for application in Korea with regard to Anti-osteoporosis agents.

Table 2. Patents for Anti-Osteoporosis Agents

Country	Appln. No.	Status	Description
Korea	2007-0056448	Granted	Composition for preventing bone loss comprising <i>Salvia miltiorrhiza</i> extracts and chitosan